

**Disclaimer**

This sheet is intended for designers, specifiers and other members of construction project teams wishing to reuse this building material or product. It is part of a collection of sheets aimed at bringing together the available information to date that is likely to facilitate the reuse of building materials and products.

This sheet has been produced by Rotor vzw/asbl within the framework of the Interreg FCRBE project - Facilitating the Circulation of Reclaimed Building Elements, supported by the entire project partnership. Sources of information include the experience of reclamation dealers and involved project partners, lessons learned from exemplary projects, available technical documentation, etc.

The sheets have been produced between 2019 and 2021. As the reclamation sector is evolving, some information, notably regarding pricing and availability, may change over the time. When the text refers to European standards, it is up to the project team to refer, if necessary, to their national implementations and local specificities.

It is important to note that the information presented here is not exhaustive or intended to replace the expertise of professionals. Specific questions are always project related and should be treated as such.

The complete collection of sheets (including the introductory sheet) is freely available from different reference websites (a.o. opalis.eu, nweurope.eu/fcrbe, futureuse.co.uk).

Non-exhaustive directories of dealers in reclaimed building materials are available on www.opalis.eu and www.salvoweb.com.

Interreg FCRBE partnership: Bellastock (FR), the Belgian Building Research Institute / BBRI (BE), Brussels Environment (BE), the Scientific and Technical Center of Building / CSTB (FR), Confederation of Construction (BE), Rotor (BE), Salvo (UK) and University of Brighton (UK).

The information contained in this document does not necessarily reflect the position of all the FCRBE project partners nor that of the funding authorities.

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Material description

By definition, natural stone kerbs are linear or curved elements of more than 30 cm in length making it possible to delimit circulation spaces such as roads, pavements, paths and other outdoor facilities. Their role is in particular to protect pedestrians from road traffic, to keep the surface coating in place and to help drain rainwater.

For a long time, they were cut manually with a spike, chisel and mallet, using traditional techniques. This old kerbs can be recognized by their more irregular contours. It was gradually squeezed out by increasingly regular standardized elements resulting from mechanical sawing. Today, concrete tends to replace natural stone for the production of new kerbs.

Like other natural stone materials, the reclamation of natural stone kerbs remains a relatively well established practice in public works and and construction. There are many companies specialising in the recovery and resale of this material. The supply of reclaimed kerbs is stable although large batches (over 500 linear metres) of identical kerbs may be more difficult to collect.

Kerbs are often diverted to make stair treads, coping, landscaping elements, bollards, etc. This fact sheet mainly focuses on the use of natural stone kerbs for roads and landscaping.

The reclamation market has a wide variety of kerbs models. These often reflect historical and regional specificities. Several criteria make it possible to distinguish them:

→ *Type*. There are mainly two main types of reclaimed natural stone kerbs:

- “Countryside” kerbs - also called “rustic” kerbs. They have rather irregular contours and faces cleaved or re-cut manually, are relatively short (30 to 50 cm) and are mainly used for landscaping.
- “Town” kerbs - also known as “road” kerbs. They have more regular contours and one or more flat faces, sawn or squared, are longer (50 to 200 cm) and generally come from roadworks.

→ *Geological origin*. Many types of rocks were used in the manufacture of kerbs. Among the most common on the reclamation market, we find sandstone, porphyry, blue stone and limestone for “countryside” kerbs. Among the most common materials for town kerbs, we find granite (pink or grey), blue stone and white limestone, in all their local variations. There is also kerbs in basalt, gneiss, travertine, slate and other rocks but these are less common on the reclamation market.

→ *Profiles*. Different kerb profiles can meet (see figures). The most common on the reclamation market are straight or rounded kerbs. Curved kerbs, corner pieces and lowered kerbs are to be found more rarely.



Kerbs in old natural stone (<19th century) - manually cut - thick and irregular. © stonecurators.com



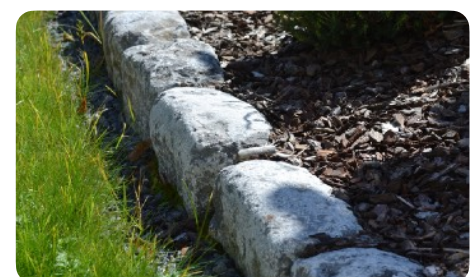
Natural stone kerbs later in the early 20th century - made using power tools - uniform and precise appearance. © stonecurators.com



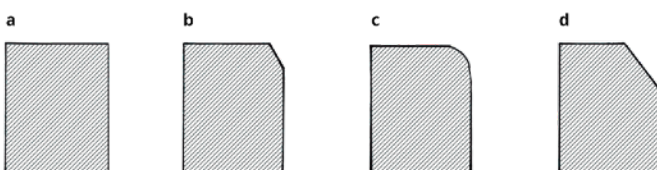
Kerbs in old natural stone (19th - 20th century) - the upper face is sawn and the other faces cut manually - more regular shape. © stonecurators.com



Blue stone “town” kerbs. Road development. © Carrière de la Hazotte



Blue stone “countryside” kerbs. Landscaping. © Carrière de la Hazotte



- a. Straight profile
- b. Chamfered
- c. Bullnosed
- d. Half battered

Commonly found kerb profiles



Natural stone kerb



Reclaimed sandstone kerbs



Reclaimed kerbs in grey granite



Reclaimed kerbs in Swedish pink granite



Reclaimed kerbs in blue stone (limestone)



Reclaimed white limestone kerbs

→ **Dimensions.** Usually the reclaimed kerb is of parallelepiped shape and has variable lengths, widths between 12 and 30 cm and heights between 20 and 40 cm. However, it is not uncommon to find elements with more specific dimensions (for example: low or lowered kerbs, slanted kerbs, etc.).

→ **Appearance.** The diversity of rocks is reflected in a wide range of colours, including within the same family: grey, beige, ochre, brown, pink, bronze, etc. A specific vocabulary is used to designate the stone inlays: veins, grains, strata, flames, stains, etc.

In addition to the original appearance of the rock, the kerbs can bear the marks of their cutting method (cleavage, sawing) and of their original finish (flaming, sanding, shot blasting, bush hammering, etc.). Over time, their appearance also varies according to the stresses of use: softening, polishing of the visible face, traces of paint, mortar or bitumen, development of organisms (mosses, lichens), etc.

When a re-machining of the reclaimed kerb is envisaged (sawing, squaring, milling, etc.), this will generally modify the appearance of the visible faces.

→ **Connections.** In some cases, the kerbs have a system of notches (male and female) at their ends. The precise assembly of the kerbs is highly dependent on the condition of this system. If necessary, it is possible to saw the ends (of all or part of the batch) to facilitate its installation.



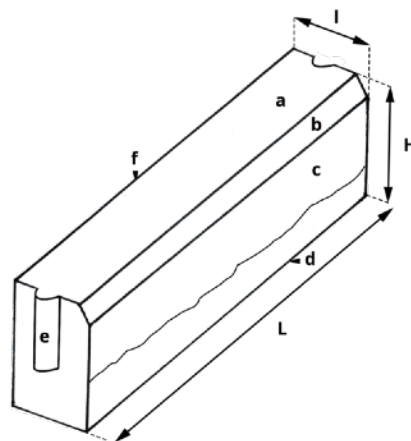
Lowered kerb profile



Notched kerb (blue stone)



Notched kerb (granite)



General anatomy of a reclaimed natural stone kerb

- a. Upper face (specific finish)
- b. Visible edge (with chamfer, bullnosed or half battered)
- c. Front face (specific finish on part of the height)
- d. Underside (rough sawn or cleaved)
- e. End (notched or rough sawn or cleaved)
- f. Rear face (rough sawn or cleaved)

$L \times W \times H$: Length x Width x Height



Material reclamation

Natural stone kerbs are good candidates for reuse, either on-site or through the professional channels of material resellers. They can also ensure the supply of batches of kerbs ready for installation. They are able to ensure the smooth running of the following operations:

→ *Dismantling test* (or expert opinion). In practice it makes it possible to ensure the feasibility and profitability of a removal. An “expert eye” generally makes it possible to estimate the interest of a batch based on plans, photos, historical documents or by an on-site visit. The focal points for kerbs will be among others:

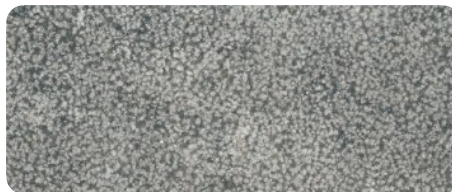
- the general condition of the batch and the laying method: condition of the stone, formats and dimensions, nature of the laying bed, characteristics of the joints, etc.
- commercial interest, depending on model, quantity, salvage and resale potential, specific regional particularities, etc.
- logistics arrangements: especially in terms of deadline, working time, handling, transport, etc.

→ *Removal*. The careful dismantling of kerbs must ensure the safety of the workers and the integrity of the recovered elements. Particular attention must be paid to the risks associated with the presence of underground service networks (cables and buried pipes). The risk of deterioration of the material is generally low during dismantling, except for elements made of soft stone, or of reduced section, requiring increased attention. The kerb is first unhooked using mechanical devices (i.e. demolition hammer) then moved using suitable lifting tools (i.e. kerb grip).

→ *Cleaning and sorting*. The collected kerbs are sorted by qualities, colours and dimensions. Elements showing deterioration (disintegration) or significant defects are discarded (in the case of kerbs in sedimentary rocks, sandstone or limestone, it is important to ensure that the cleavage plane or sedimentation plane is parallel to the direction of laying). Cleaning with water (high pressure) or by scraping is generally sufficient to remove laying residues, jointing products and other elements which could adhere to it.

→ *Treatments*. While some kerbs can be re-used as is after a rough cleaning, others may require additional operations such as:

- *Sawing*: in order to obtain flat and vertical side faces or to homogenize the dimensions of the kerbs (for example, to give them a constant height in order to facilitate their installation). It is common to saw off the ends to make up for any damage or to adapt the notch systems.
- *Sizing and machining*: in order to resume and correct the profile of the kerbs and ridges.
- *Finishing*: in order to homogenize the appearance of the stone or give it a rough appearance on the visible parts. Several techniques are possible depending on the nature of the stone and the expected performance: bush hammering, sanding, flaming, shot blasting, pitting, etc. A specific vocabulary determines the type of finish depending on the type of rock concerned. Some examples :



Bush hammered blue stone



Chiselled blue stone



Flamed granite

- *Cleavage*: kerbs that's unsuitable for cutting can be split in order to form paving stones.

These various operations can be carried out by specialized suppliers within their facilities. They can also be considered on site, provided that the site logistics allow it.

Design Tip!

In general, the cost of kerbs increases with the number of operations required. When usage requirements allow, rough kerbs are the most economical solution. Sawing is however an exception to this rule since it allows, in a relatively simple operation, to double the quantity of potentially available material! However, it should be ensured that the cut elements meet the requirements of use (in particular for their dimensions).



Kerb sawing © Carrière de Bonneuil-sur-Marne



Kerb finishing by bush hammering © Carrière de Bonneuil-sur-Marne



Kerb cleavage © Arnaud Bouissou - TERRA



Natural stone kerb

→ *Storage and packaging.* Natural stone kerbs are generally stored outside, packaged and strapped on pallets. They are arranged horizontally. Ideally, they are separated by wedging elements in order to limit the risk of damage. Metal straps should be avoided as there is a risk of staining the stone (rust). Ready-to-install kerbs are clearly identified and labelled in uniform batches. Short kerbs (such as “countryside” kerbs) can also be packaged in a big bag or in a crate. The packaging must take into account the large mass of the elements (the pallets may have to support loads of more than 2 t). Appropriate means of transport and lifting are also required.

Reclaimed natural stone kerbs are generally sold by the linear metre or by the ton. Most suppliers are able to provide a technical sheet showing their main characteristics (type of rock, nominal dimensions and tolerances, finish, intended applications) and, in certain cases, their origin.



Bulk storage © Pavés de rue



Storage on strapped pallets © Hofman NV-SA



Pallet storage © Van Dijk



Paris paving depot, Bonneuil-sur-Marne. Stock of cobblestones and stone kerbs ready to be sorted, cleaned and reused in sites in the city of Paris (FR) © Ville de Paris, Florence Morisson.

Did you know?

Some towns have their own stock of road materials. In Paris, for example, it is mandatory to reuse suitable paving and kerb stones on site or to divert them to a centralized stock, which contractors must also use for new developments. This platform, set up more than 20 years ago, ensures, among other things, the collection, sorting, cleaning and storage operations of Parisian paving and kerb stones. In addition to minimizing the costs associated with the purchase of new materials, it would prevent the dumping of 7,000 to 8,000 tonnes of granite per year, corresponding to 600 tonnes of not emitted CO₂. (Source : Paris City Hall Maintenance and Supply Centre (CMA, ADEME).



Applications and laying

Reclaimed natural stone kerbs are mainly used for marking out roads or for less demanding landscaping applications (delimitation, low wall, steps, benches, bollards, etc.).

The choice of a type of kerb depends on the demands specific to the intended use: traffic, climatic conditions, town planning rules, etc. On roads, the kerb must be able to withstand impact from the wheels and friction from tyres. They must also be able to channel rainwater. It is therefore important that they be placed on a solid foundation and sufficiently buttressed so as not to come free.

The majority of the points of attention related to the installation of reclaimed stone kerbs do not differ from those linked to new ones - in particular, and in a non-exhaustive way: type and dimensions of the kerbs, type of foundation and of the laying layer, type of grouting, buttress arrangements, water runoff, type of road surface covering, etc.

It is up to the designer/specifier to rely on the regulations, the rules of the art and the technical standards in force in this field. It should be noted that some local reference guides on the installation of stone cladding elements already include the case of reclaimed kerb stones (for example: the Quali-route standard developed in the Walloon Region, Belgium).

Depending on the planned batches, the reclamation of kerb stones may require special attention to the following aspects:

- Variable height of the kerbs. It is possible that the kerbs have different heights due to the irregularities of the underside. If necessary, this can be corrected by adapting the foundation layer.
- Variable length of the kerbs. Due to the variable length of the kerb stones, it is more practical to use clamps which grip the edges across their width. However, this implies that the kerb is laid before paving, so that there is sufficient space for the clamp.
- Visible traces. Kerbs with visible traces of another material (asphalt, paint, mortar, etc.) can be evenly distributed over the length concerned. If necessary, the kerb stones that have these traces can also be reserved for less demanding uses in this regard.

- Irregularities of the extremities. If necessary, these can be sawn to provide flat side surfaces.
- Junction with special kerbs. When new elements are incorporated into the structure (for example: lowered kerbs, curved kerbs, corner elements, etc.), it is necessary to ensure their compatibility with the planned reclaimed kerbs.

Furthermore, adequate installation requirements must be specified to cover the wide variety of possible applications of reclaimed kerbs.

In general, finding a batch with very specific characteristics can be complicated. It is often preferable to identify a batch of raw reclaimed kerbs and to consider additional processing operations. The expertise of professionals can be invaluable in this regard.

The following characteristics can be described and specified when drafting the technical requirements related to the delivery of a batch of reclaimed kerb stones:

→ **Batch composition.** The batch of reclaimed kerbs is made up of elements of the same type ("countryside" or "town" kerbs), of the same geological nature (sandstone, granite, porphyry, white limestone) or even of the same original use (use on busy roads, areas subject to frost, etc.). However, mixed kerb stone batches may be suitable for less demanding applications.

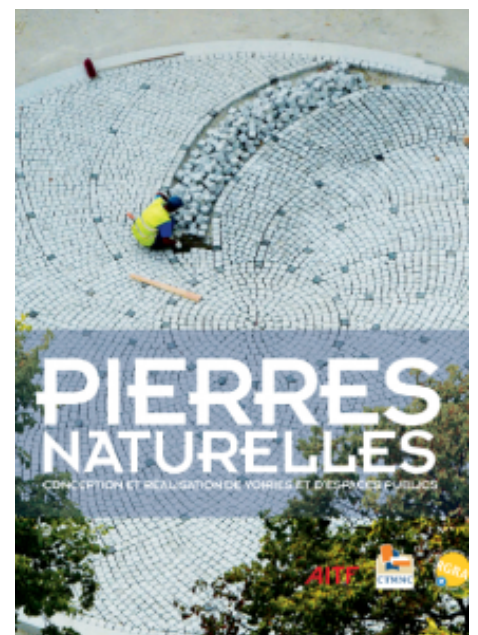
→ **Dimensions.** In general, the dimensions must be uniform in width and thickness. The kerb stones must be sufficiently flat and straight. Depending on the design, the batch can be split into sub-batches of different dimensions. To limit costs and facilitate the identification of recovered kerbs batches, it is preferable to be flexible enough on the dimensions by opting for a free-length installation, by defining only a minimum length (for example, min. 40 cm) or by setting a fairly wide gap (for example, length between 80 and 120 cm). If necessary, it is also possible to insist on more precise dimensional characteristics (as well as tighter dimensional tolerances). This may result in a heavier transformation of the material (sawing, re-machining).

→ **Texture and finish.** Depending on the requirements (functional and aesthetic) and the type of rock, the appearance of the visible faces (bush-hammered, flamed, scabbled, shot-peened, etc.), non-visible faces and ends

(sawn, cleaved) should be specified. Depending on the burial depth, the face may only be squared over part of the height. This must then be specified.

→ **Profile.** ditto If necessary, the profile of the kerb stones and the condition of each edge should be specified (straight sawn, chamfer, bullnose, half battered, without requirements, etc.). For a greater profile uniformity, it is necessary to be precise on the dimensions (and their respective dimensional tolerances) and to envisage a possible transformation of the edges.

→ **Hue.** By nature, natural stones have a wide variety of colours and appearances. Depending on usage requirements (for example, in the context of heritage renovation), it is possible to specify this characteristic by referring to a general hue or to a specific colour.



Pierres naturelles - Conception et réalisation de voiries et d'espaces (2019) (In french), RGRA, 440 p., ISBN : 978-2-913414-52-5



→ **Condition.** In addition to traces of mortar, paint and bitumen residues, reclaimed kerbs may show minor alterations such as signs of surface wear, chips, light cracks, craters, light flaking, stains, leftover moss, etc. These deteriorations can influence the technical and aesthetic performance of the kerbs, as well as their re-installation, but do not constitute a major obstacle to reclamation - except for very specific uses (see § "Characteristics and fitness for use").

Depending on the nature of the rock, other aspects can be considered as major imperfections. For example, kerbs in sedimentary rock (i.e. sandstone, limestone) must necessarily present a cleavage plane (and stylolitic joints) parallel to the direction of laying, otherwise the stone will disintegrate. Another example: certain limestone rocks (i.e. blue stone) may have stylolitic joints liable to weaken the stone. These imperfections can sometimes be suitable for parts of kerbs that are not visible. To a large extent, the existing technical documentation makes it possible to assess these various aspects on a case-by-case basis. Professionals can also be consulted.

It is up to the designer/specifier to define the degree of imperfection tolerated, according to the defined use and the installation conditions, by specifying the degree of acceptable alterations (for example: chips, cracks and flaking < x cm² tolerated on visible sides, broken corners and edges tolerated on invisible parts, etc.).

Note that kerb stones with irregularities or traces of bitumen are perfectly suited to certain applications and are less expensive than more calibrated kerbs.

→ **Quantities.** To increase the quantity of kerb stones available, the designer/specifier may consider combining different batches (for example: granite + sandstone) and/or planning a deadline for the supplier to be able to bring together the required quantity. In the case of an on-site reclamation scenario, it is advisable to provide a reserve stock of kerb stones in order to carry out subsequent repairs and replace damaged kerbs.

Most professional suppliers are able to ensure that delivered batches meet these requirements. A control test procedure based on a contractual sample and sampling upon receipt can be set up.

Most of the reclaimed building materials are sold as is. The conditions of sale may however contain special guarantees specific to the material. Some suppliers are able to indicate the origin of the material and/or provide documentation on the product purchased (for more information, see the introductory sheet).

Design tip!

It is better to order a quantity expressed in linear metres rather than in number of pieces, given the irregular lengths of the reclaimed kerb stones.



Example of stylolitic joints



Place de la Bastille, Paris. Reclamation of 10,000 old kerb stones sawn in half to be transformed into flagstones (FR). © Benjamin Randow



Reclamation of kerb stones for staircase steps (FR). © Noblema



Characteristics and fitness for use

The harmonised European standard EN 1343 establishes the relevant characteristics (depending on the context) in order to determine the fitness for use of natural stone kerbs intended for exterior paving. Although detailed for new materials from the extraction and processing of natural stones, these characteristics may prove useful in considering the specific case of reclaimed kerb stones.

Characteristics	Comments
Geological origin and petrographic description	The reclaimed kerb stones come from works that may have been made from batches of multiple origins. If it is possible to visually characterize the type of rock present, it is however more difficult to affirm with certainty that their geological origin is identical, unless there are records that allow it to be attested (for example: a certificate of origin, archival documents ...). This is all the more true for the batches made up of kerb stones of various origins.
Geographical origin	As with the geological provenance, information on the original geographic provenance of a batch of reclaimed kerb stones is difficult to certify with any certainty. On the other hand, we can deduce certain characteristics if we know where the kerb stones were removed. Thus, kerb stones in good condition that have been dismantled in an area subject to strong freeze/thaw cycles are likely to show good frost resistance. Another example: kerb stones in good condition coming from a street subjected to intensive traffic by heavy vehicles testify in some way to their good compressive strength. Thus, in the absence of information on the original quarry, it may be useful to have information on the roadway where the kerb stones come from.
Bulk density and open pores	<p>These characteristics are specific to each stone. The density [kg/m³] gives an indication of the degree of compactness of the stone. In general, the more compact a rock, the less porous it is.</p> <p>The open porosity of a stone is the proportion of interconnected pores that are accessible to water. It is expressed in [% by volume]. It is usually estimated by measuring the water absorption (mass of water absorbed in relation to the mass of a dry test piece). This characteristic influences in particular the degree of resistance to stains and soiling. It does not directly affect the frost sensitivity of the stone element (it is rather its capacity to return the absorbed water that matters at this level).</p> <p>This information can be estimated based on technical documentation relating to natural stones (see <i>table below</i>). If necessary, these characteristics can be measured more precisely by an identity test as defined by the test EN 1936.</p>
Geometric characteristics	<p>These characteristics can be found out by taking simple measurements. They are closely linked to the degree of sorting and cleaning of the reclaimed kerb stones as well as to the transformation operations undertaken on the material. In the case of kerbs intended to be re-machined or re-cut, it is advisable to define with the supplier the dimensional tolerances applicable to each of the dimensions (width, thickness, length, radius of the bullnose, geometry of the chamfer, etc.) the equipment required, the type of stone and the functionality of the works (these various aspects are described in standard EN 1343). The requirements in terms of flatness and straightness should also be detailed.</p> <p>In general, raw reclaimed kerbs show irregularities in shape related to the original manufacture and the degree of wear.</p>
Slippage	<p>This feature influences the comfort and safety of users. It mainly depends on the roughness and texture of the surface. It can be assessed visually. The coarser it is, the more non-slip it is. This characteristic changes over time under the influence of the surface wear, the presence of dirt, the maintenance conditions, the slope, the density of the joints and the climatic context (rainfall). The in-depth evaluation of the slip resistance (managed by the EN 14231 test standard) is relevant when the structure is intended for pedestrian traffic. This standard further stipulates that embossed or cleaved squared kerb, with a surface roughness greater than 1.0 mm, meet the slip requirements without prior test measurements.</p> <p>In the case of reclaimed kerbs, a specific finishing treatment adapted to the type of stone can be considered. Certain finishing treatments (flame treatment, for example) may be applied during use in order to meet the requirements in force.</p>
Wear resistance	This durability characteristic depends on the intensity and type of traffic, the presence of abrasive particles and the maintenance conditions. If there is a test standard which allows this characteristic to be evaluated with precision (EN 14157 - Capon test), it can also be used for reclaimed kerb stones, by relying on the way in which they have withstood the demands of their first use. In general, granites and basalts are suitable for intense stress and are more resistant to wear than sandstones and limestones.



Characteristics	Comments																
Flexural strength	<p>The flexural strength R_f [MPa] is a mechanical characteristic which provides information on the capacity to resist bending forces in use. It varies according to the type of stone and is generally determined by means of bending tests as per standard EN 12372.</p> <p>The flexural strength makes it possible to determine the admissible breaking load [kN] of the kerb, according to their dimensions, and to the following formula:</p> $P = \frac{R_f \times W \times t^2}{1500 \times L \times F_s}$ <p>where P : breaking load [kN] W, L, t : width, length and thickness [mm] R_f : flexural strength [MPa] F_s : safety factor, generally F_s = 1.6</p> <p>In the case of roadside kerbs, the applicable requirements can be summarized in the following table:</p> <table border="1"> <thead> <tr> <th>Recommended use</th> <th>Breaking load (kN)</th> </tr> </thead> <tbody> <tr> <td>decoration</td> <td>No requirements</td> </tr> <tr> <td>pedestrian use only</td> <td>> 0.75</td> </tr> <tr> <td>pedestrian and cycling areas</td> <td>> 3.5</td> </tr> <tr> <td>occasional access for light vehicles, garage entrances</td> <td>> 6</td> </tr> <tr> <td>pedestrian traffic area, market places, occasional circulation of delivery/rescue vehicles</td> <td>> 9</td> </tr> <tr> <td>pedestrian traffic area frequently used by heavy trucks</td> <td>> 14</td> </tr> <tr> <td>roads and streets</td> <td>> 25</td> </tr> </tbody> </table> <p>However, in the case of reclaimed kerbs, it can be assumed that elements which have been subjected to high stresses during their life will continue to meet similar or lower requirements. A detailed examination of the conditions of initial use therefore makes it possible to assess the flexural strength capacity of the reclaimed kerbs, without any specific test measurement.</p>	Recommended use	Breaking load (kN)	decoration	No requirements	pedestrian use only	> 0.75	pedestrian and cycling areas	> 3.5	occasional access for light vehicles, garage entrances	> 6	pedestrian traffic area, market places, occasional circulation of delivery/rescue vehicles	> 9	pedestrian traffic area frequently used by heavy trucks	> 14	roads and streets	> 25
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Resistance to freezing/thawing (and de-icing salts)	<p>For an exterior application, the natural stone elements must be able to withstand freezing/thawing without their appearance or their mechanical characteristics being affected. The source and condition of a batch of reclaimed kerb stones can provide a useful guide to determining their resistance to freezing/thawing. Many old kerb stones are in fact likely to have withstood, during their first use, more freeze/thaw cycles than what is recommended by the test standard which allows this performance to be assessed (EN 12371). It is therefore important to find out about the geographical origin of the batch to ensure the original climatic conditions (for example, a batch coming from a continental climate in northern Europe will probably be suitable for an application in the Mediterranean climate of the South of France. The reverse is not necessarily true). Generally, less resistant kerb stones that have suffered frost damage will probably have been discarded during the sorting and cleaning steps.</p>																
Dirt resistance	<p>This characteristic depends greatly on the porosity of the stones and the degree of finish. It is possible to assess this performance by observing the degree of soiling on the visible face of the untransformed (un-sawn) reclaimed kerb stones. If necessary, specific surface treatments can also be recommended to improve this performance, by slowing the infiltration of oily substances into the voids of the stone (surface treatment with silanes, siloxanes, teflon, etc.).</p>																

As an indication, the following table shows some of the known performances of some types of rock constituting kerb stones which are frequently reclaimed. It is important to point out that each stone has its own characteristics and that two batches of kerb stones of the same rock can however have quite different performances.

	Bulk density (kg/m ³)	flexural strength (MPa)	Porosity	Wear resistance
Sandstone	2000 - 2700	20 - 30	little porous (0.5 to 10%)	++ (+)
Soft limestone (ex: white stone)	< 2500	-	porous (5 to 50%)	++
Compact limestone (ex: blue stone)	> 2500	10 - 25	little porous (0.2 to 5%)	++
Porphyry	2000 - 2800	15 - 30	very little porous (0.2 to 2%)	+++
Granite	2500 - 3000	15 - 30	very little porous (0.2 to 2%)	+++



Availability

There are many professionals who sell reclaimed natural stone kerbs. However, supplier stocks are not always stable. It is recommended to check with professionals early enough in the event of a large order (several hundred linear metres).

Indicative prices (Excl. tax, for private customers)

A non-exhaustive sampling of the reclamation market in North West Europe (Belgium, France, Great Britain and the Netherlands) made it possible to extract some indicative prices. These vary depending on the format, the size and type of stone, as well as the degree of sorting and cleaning requested.

- Reclaimed “countryside” kerb:
~ 25 - 30 € / linear metre
- Reclaimed “roadside” kerb:
~ 40 - 70 € / linear metre

Find specialised businesses



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opalis.eu



Place du Panthéon, Paris (FR). Les Monumentales (Emma Blanc, Collectif ETC, Genre et Ville, Albert and co.). Reclamation of 400 granite kerb stones (or blocks) in landscaping. © Lucas Bonnel et © Samuel Colin-Canivez



Did you know?

The pink granite street elements that are currently on the reclamation market in Belgium originate from Swedish quarries. These paving and kerb stones were used as ballast in the holds of ships traveling between Belgium and Sweden. Once unloaded in the port cities, they found new uses there in the work of fitting out public spaces.



Lower Mystic Lake House (USA). Reclamation of stone kerbs. © matthew-cunningham.com



According to the sources and types of stone, reusing 100 metres of reclaimed natural stone kerbs prevents the production of ~ 680 to ~ 7880 kg of CO₂ equivalent related to the manufacture of new kerb stones (production phase only). According to sources, this corresponds to the emissions of a trip of ~ 4050 to ~ 47250 km in a small diesel car.

If the reclamation of natural stone kerbs replace new concrete kerbs, this gain is also interesting.

Embodied carbon (Cradle to gate - production A1-A3)

	kg CO ₂ eq./linear m	kg CO ₂ eq./kg
INIES database (FR) – Generic data– Natural stone kerb *	35,8	-
INIES database (FR) - Generic data - Concrete kerb **	29,0	-
ICE database (UK) - Granite***	78,8	0,7
ICE database (UK) - Limestone ****	10,1	0,09
ICE database (UK) - Sandstone *****	6,8	0,06

* Indicative value to ensure the function of 1 linear metre of natural stone kerb for a reference lifespan of 150 years.

** Indicative value to ensure the function of 1 linear metre of concrete road kerb and the collection of runoff water for a reference lifespan of 50 years.

*** Indicative value for 1 linear metre of granite kerb (width = 15 cm, thickness = 30 cm, density = 2500 kg/m³).

**** Indicative value for 1 linear metre of limestone kerb (width = 15 cm, thickness = 30 cm, density = 2500 kg/m³).

***** Indicative value for 1 linear metre of sandstone kerb (width = 15 cm, thickness = 30 cm, density = 2500 kg/m³).